

REMARKS

Claims 1-55 remain in this application.

The Applicants acknowledge the Examiner's withdrawal of the previous grounds of rejection based on U.S. Patent No. 5,302,214 ("UEMATSU").

In the new grounds of rejection, all of claims 1-55 were rejected under 35 U.S.C. § 103(a) as unpatentable over Japanese Laid-Open Patent Application H8-120417 ("JP '417") in view of U.S. Patent 5,427,634 ("FUJITA").

For at least the following reasons, Applicants submit that each of claims 1-55 is allowable over the references of record. Accordingly, Applicants respectfully request that the previous rejections be withdrawn and a Notice of Allowability be issued.

JP '417 discloses a stainless steel composition suitable for temperatures of 600-650°C, having a Tungsten concentration of 0.1-1%. The present application provides compositions that are suitable for temperatures including 900°C, having a Tungsten concentration of more than 2% -- more than double the upper limit set by JP '417.

The Office Action contends that the presently claimed invention would have been obvious over the different chemical composition of JP '417 because that reference "teaches the same utility (components for automobile exhaust gas system) and

similar properties such as high temperature strength, corrosion resistance and superior workability." (Office Action at ¶ 5).

However, JP '417 states that it actually is directed at a different utility (i.e. strength and workability at temperatures of 600 - 650°C rather than the 900°C environments facilitated by present invention). In that respect, it would not have been obvious to one of ordinary skill in the art to more than double the concentration of Tungsten taught by JP '417 for use in temperature environments not contemplated by that reference, and particularly where that reference (like UEMATSU) explicitly teaches directly away from that modification.

The Federal Circuit has explained that an obviousness rejection can be rebutted by showing that the prior art in any material respect taught away from the claimed invention. In re Haruna, 249 F.3d 1327, 1335, 58 USPQ2d 1517, 1522 (Fed. Cir. 2001). The Court further explained that a reference teaches away when a person of ordinary skill in the art, upon reading the reference, "would be led in a direction divergent from the path that was taken by the applicant." Id.

In this case, the explicit teachings of JP '417 would have led one of ordinary skill in a direction divergent from the path taken by Applicants.

The Office Action correctly recognizes that JP '417 limits the upper concentration limit of Tungsten to 1%, but incorrectly assumes that limitation to be based solely on

economic considerations, apparently relying on a machine translation of the Japanese language text. Applicants have obtained, and provide herewith, a human translation of JP '417. At paragraph 41 of the human translation, the same paragraph cited in the Office Action, JP '417 explains that "if W is excessively added, the toughness and workability deteriorate and the cost increases, therefore W should be 0.1 ~ 1%."

Thus, JP '417 merely comports with the disclosure of UEMATSU, which patent the Examiner correctly withdrew as a grounds of rejection, that the addition of alloying elements such as Tungsten to increase high temperature strength is to be avoided because they "steeply" weaken toughness and "remarkably" worsen workability. (See UEMATSU at column 2, lines 25-33, which Applicants cited in their last response).

JP '417 is directed at a ferritic stainless steel that exhibits high-temperature strength at temperatures of 600 - 650°C and exhibits "excellent workability" and "toughness." (Human translation at p. 2, following "Purpose"). Increasing the Tungsten concentration above the stated limit of 1% would, according to JP '417, deteriorate the very properties of workability and toughness that JP '417 seeks to provide, and consequently defeat that patent's fundamental purpose.

Thus, JP '417 teaches directly away from the very modification that the Office Action urges as obvious. One of ordinary skill in the art, upon reading the disclosure of JP

'417, would be directed not to do what Applicants have done - increase the Tungsten concentration to more than 2%. Accordingly, the present claims are neither disclosed nor fairly suggested by the opposite teaching of JP '417.

FUJITA does not cure the deficiencies of JP '417. Rather, FUJITA actually reinforces the Tungsten upper limit described in JP '417.

FUJITA, like JP '417, directs that while Tungsten at low concentrations is effective to enhance high-temperature strength, excessive Tungsten deteriorates toughness. (See FUJITA at Col. 4, lines 48-53 and 55-60). Moreover, FUJITA adds another reason to not increase Tungsten concentration to the levels presently claimed. According to FUJITA, Tungsten concentrations that are more than 2% drastically increase the material's susceptibility to NaCl-induced hot corrosion. (See, e.g., Figure 2; Col. 4, lines 53-55; Col. 10, lines 46-60; and Col. 19, lines 26-32).

NaCl-induced hot corrosion, such as would result from automobile exhaust systems being exposed to salted winter roads, would have been an issue of significant concern in the exhaust system steels disclosed in both FUJITA and JP '417. Thus, FUJITA provides another reason why one of ordinary skill in the art would not have increased Tungsten beyond the upper limit set by JP '417.

The Office Action contends, at paragraph 6, that FUJITA discloses Tungsten concentrations as high as 3%. However, close reading of FUJITA reveals that 3% is the upper limit of the cumulative amount of Tungsten and Molybdenum. For example, FUJITA states at column 19, lines 34-35, that "the NaCl-induced hot corrosion resistance deteriorated when the Mo+W content exceeded 3%." (emphasis added). When Tungsten is present without Molybdenum, FUJITA requires that "the upper limit is set to 2%." (Col. 10, lines 52-54).

The distinction of the present claims over the prior art is further exemplified by FUJITA's Tables 1 and 2. Specifically, FUJITA tabulates properties for certain "comparative steels," including NUS26 and NUS27, which purportedly contain Tungsten at concentrations of 4.4% and 2.2%, respectively. (Table 1). Those compositions reportedly have increased Tungsten concentrations, but do not satisfy all of the features recited in the present claims. FUJITA reports that NUS26 and NUS27 exhibit tensile strengths at 900°C of 27.1 and 28.0 N/mm<sup>2</sup>, respectively. (Table 2). Those tensile strengths correlate approximately to 0.2% proof stress values of 15 and 15.5 N/mm<sup>2</sup>, respectively.<sup>1</sup> By contrast, Table 2 of the present specification shows compositions according to the present

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<sup>1</sup> As is apparent from the June, 1990 article by Nakamura et al., submitted herewith including a partial English translation, 0.2% proof stress ( $\sigma_{0.2}$ ) is generally proportional to tensile strength (TS) by a factor of about 1.8, or  $\sigma_{0.2} \approx TS/1.8$ . (See Tables 1 and 4, and Figures 6 and 7).

invention that exhibit substantially higher tensile strengths at 900 °C of 17-25 N/mm<sup>2</sup>.

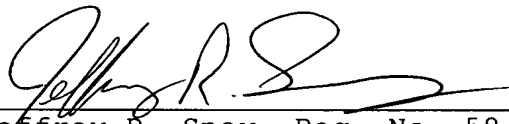
For all of the foregoing reasons, Applicants respectfully request that the Examiner withdraw the previous rejections and issue a Notice of Allowability with respect to all of pending claims 1-55.

Should there be any matters that need to be resolved in the present application, the Examiner is invited to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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**Appendix:**

The Appendix includes the following items:

- English translation of JP H8-120417
- June 1990 article to NAKAMURA et al.
- Partial translation of June 1990 article to NAKAMURA et al.